water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

BRANCH INFRASTRUCTURE MANAGEMENT

WATER RESOURCES INFRASTRUCTURE OPERATIONS AND MAINTENANCE

OPERATIONS EASTERN

SUB-DIRECTORATE: MECHANICAL/ ELECTRICAL MAINTENANCE

TECHNICAL SPECIFICATION

SERVICE, REPAIR, SUPPLY, DELIVERY, AND INSTALLATION OF AIR-CONDITIOING

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Contents

SERVICE, SUPPLY, DELIVERY, INSTALLATION AND COMMISSION OF AIR-CONDITIONING UNITS

1. INTRODUCTION

Operation Eastern is responsible for maintenance and operation of state assets located on the eastern part of the country, mostly within the Province of KwaZulu Natal. Majority of state assets that are operated and maintained by eastern operations are old and need maintenance.

Department of Water and Sanitation, air-conditioning are old need repairs and replacement. In some dams, Department has buildings that does not have air-conditioning units and some buildings has an existing air-conditioning that are no longer operational and need replacement.

Department of Water and Sanitation had intended to replace existing damaged or not operational air-condition and install new air-condition on department building using a term contract. Department of Water and Sanitation had planned to have a term contact with a service provider for supply, delivery, installation, and commission of air-conditioning units.

Arrangements for site access shall need to be in line with the policies of Department of Water and Sanitation.

2. LOCATIONS OF THE DAMS

Eastern cluster is responsible for maintenance and operations of the state dam within Pongola – Mtamvuna WMA (Water Management Area), in KwaZulu Natal and easter part of Eastern Cape province. Eastern cluster had divided the state dams into three (3) regions for this project (installation of air conditioner to state buildings within properties owned by the state) operated and maintenance. Table 1 to 3 details location of the state dams, where service, supply, installation and commissioning of air-conditioning is intended.

Table 1: Location of midlands dams

Dam name	Nearest town	Co-ordinate	Kilometre from nearest town
Craigieburn Dam	Between Mooi River and Greytown (Mnyamvubu area)	-29,1634^0 S 30,28714^0 E	42km
Midmark Dam	Howick	-29.49904^0 S 30.20974^{0}E	5km

Table 2: Location of Southern dams

Dam name	Nearest town	Co-ordinate	Kilometre from nearest town
Spioenkop Dam	Winterton	-28.68100^0 S 29.51700^{0}E	24km
Wagendrift Dam	Estcourt	-29,04208^0 S 29,85316^0 E	5.8km

Table 3: Location of Northern dams

Dam name	Nearest town	Co-ordinate	Estimated distance from nearest town
Hluhluwe Dam	Hluhluwe	-28,12169^0 S 32,17967^0 E	23km
Klipfontein Dam	Vryheid	-27,838944^{0}S 30,815472^0 E	11km
Goedertrouw Dam	Between Eshowe and Nkwalini	-28,77285^0 S 31,46921^0 E	30km
Ntshingwayo Dam	Between Durnacol and Newcastle	-27,95423^0 S 29,94882^0 E	26km
Pongolapoort Dam	Jozini	-27,41883^0 S 32,07088^{0}E	2km

3. SCOPE OF WORK

Awarded bidder will be required to install wall mounted air-conditioning units to department buildings. Air Conditioners Specification to be supplied and Installed and

Commissioned is detailed in table 4 below. Table 4 summarises an estimated type and number of air-conditioning that may be installed.

Table 4: Summary and type of air-conditioning to be supplied, Installed and Commissioned

ITEM	QUANTITY	DESCRIPTION
1.	13	The supply; installation and commission of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.
2.	31	The supply; installation and commission of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.
3.	105	Conditional assessment, Service and repair of Air-conditioning.
4.	7	Conditional assessment, Service and repair of heat exchanger or extractor fans

Table 5 to 7 details estimated number and type of air-conditioned that maybe required from contractor for installation per dams. Table 8 details air-condition that need service and repairs at Midmar Dam.

Table 5: Unit description for midlands dams (region)

Dam name	Unit description	Number of units
Craigieburn Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3
Midmar Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per Specification.	5
	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per Specification.	4

Table 6: Unit description for Southern dams (region)

Dam name	Unit description	Number of units
Spioenkop Dam	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.	4
	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3
Wagendrift Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	1
	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.	2

Table 7: Unit description for Northern dams (region)

Dam name	Nearest town	Number of units
Klipfontein Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	4
	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.	1
Goedertrouw Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	6
Hluhluwe Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3
Ntshingwayo Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3
Pongolapoort Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3

Dam name	Nearest town	Number of units
	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.	2

Table 8: Details air-condition that need service and repairs at Midmar Dam and Pongolapoort Dam

LINE	SERVICE /GOODS DESCRIPTION	QUANTITY	SPECIFICATION
1	Service and repair of about one (1) air conditioning	1	Conduct condition assessment and service and repair one air conditioning at Pongolapoort Dam
2	Service and repair of about one hundred and four (104) air conditioning	104	Conduct condition assessment and service and repair one hundred and four (104) air conditioning at Midmar Dam

Table 9: Details of heat exchanger or extractor fans that need service and repairs at Midmar Dam

LINE	SERVICE /GOODS DESCRIPTION	QUANTITY	SPECIFICATION
1	Service and repair of seven (7) heat exchanger or extractor fans	7	Conduct condition assessment and service and repair seven (7) heat exchanger or extractor fans

4. SPECIFICATION

Units must be supplied as per order issued and installed as per specification detailed below. For number of units and type to be installed refer to table 4 to 7 above.

4.1 Required Features

Type: Mid-Wall split units

- Units must be of non-inverter Type
- The units must employ R410A gas.
- Units must be able heat and cool.
- Units must be able to dehumidify
- The units must have an Auto Clean function
- Units must have at least 3 speed fan plus auto speed selection.

- Units must be supplied with remote control units Wireless LCD
- Units must have timers to stop and start the units at predestined times.
- Units must have air direction control in the vertical plane [Auto up/down] and in the horizontal plane [Manual left/right].
- Units must have an Auto feature so that when the Auto setting the unit must be able to run between the heating or cooling modes while operating to maintain the present inside temperature regardless of changes in outside conditions. [Auto changeover]
- The units must operate on single phase at a voltage of 220V - 240V.
- Power supply for the units is situated indoors.
- The units must be able to auto restart after a power failure. [Auto Restart]

4.2 Mounting: The external units must be wall mounted on galvanized brackets.

4.3 Ducting: All piping and electrical wiring must be enclosed in plastic ducting for neatness and protection both internally and externally of the building.

4.2.1 Electrical Wiring: To be done in accordance with SABS 10142/2 Regulations.

4.2.2 Operating Manuals: Units must be supplied with operating manuals.

5. BILL OF QAUNTITIES

Estimated bill of quantities for this project is detailed in table 10 below. Bidders should complete and use table 10 for quotation of this project and total amount or sum amount should be added on the SBD3.1 form for pricing or biding purposes. Bidder should include provisional sum value on the total amount.

Table 10: Bill of quantities for supply, installation, service, repair and commission of air-conditioning

Dam name	**BTU unit**	**Number of units**	**Unit price (Rands)**	**Price (Rands)**
Craigieburn Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3		
Midmar Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per Specification.	5		

Dam name	BTU unit	Number of units	Unit price (Rands)	Price (Rands)
	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per Specification.	4		
Spioenkop Dam	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.	4		
	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3		
Wagendrift Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	1		
	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.	2		
Klipfontein Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	4		
	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.	1		
Goedertrouw Dam	The supply and installation of 9 000BTU Heating/Cooling Air-	6		

Dam name	BTU unit	Number of units	Unit price (Rands)	Price (Rands)
	conditioning Units as per specification.			
Hluhluwe Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3		
Ntshingwayo Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3		
Pongolapoort Dam	The supply and installation of 9 000BTU Heating/Cooling Air-conditioning Units as per specification.	3		
	The supply and installation of 12 000BTU Heating/Cooling Air-conditioning Units as per specification.	2		
	Service and repair of about one (1) air conditioning	1		
Midmar Dam and Pongolapoort Dam	Service and repair of one hundred and four (105) air conditioning	105		
Midmar Dam	Service and repair of seven (7) heat exchanger or extractor fans	7		
OHS [Section OHSA 193 safety specification]	Provide a Health and Safety Plan	1		
	Conduct a Risk assessment by contractor in terms of construction regulation 2003	1		

Dam name	BTU unit	Number of units	Unit price (Rands)	Price (Rands)
	Appointments Health and Safety Representative for the duration of the project	1		
	Keep all records and registers for the duration of the project	1		
	Maintain Health and Safety File for the duration of the project	1		
Provisional sum				
Subtotal (rands), VAT exclusive				
Subtotal (rands), VAT inclusive				

6. PURCHASE ORDER AND INVOICING.

6.1 The hired contractor or successful bidder will be issued with an order for supply and delivery, installation, service, repair and commissioning of air-conditioning by the project manager or department representative conjunction with project manager, this exercise will be done when required by project manager.

6.2 Invoice will be done based on the capacity and number of air-conditioning installed or order created and issued to a contractor. See Table 8 above.

6.3 The contractor must report to project manager or delegated person by project manager on arrival and security entrance book must be signed. Contactor must ensure that photos are taken before, during and after service and or installation and submit as a proof or evidence.

6.4 The contractor should have allowance of other work which may be not covered by the specified work, this may include extension of electrical cables, electricity brakers…etc, to connect air-conditioning to electrical supply within buildings and estimated cost must be added as a separate item i.e., provisional sum on bill of quantities.

7. OCCUPATIONAL HEALTH AND SAFETY

The state dams, building and related infrastructures is owned and operated by Department of Water and Sanitation and site access as well as Occupational

Health and safety will need to be in line with Department of Water and Sanitation policies and procedures.

The Occupational Health and Safety and Regulations (Act number 85 of 1993) is applicable. Construction Regulations, Electrical Installation Regulation, Noise-induced Hearing Loss Regulation, and Confined Areas have particular reference. The contractor shall notify the Department of Labour, prior to commencing with the project. The DWS shall ensure that the provisions of the OHS are complied with for the duration of the project. The contractor prior to commencing on with the project shall submit:

- A comprehensive OHS file in accordance with the OHS Act.
- A detailed site-specific risk assessment for review and acceptance.
- A detailed method statement for approval by the Project Manager.

All work shall be done in accordance with relevant legislation(s) and regulation(s). The DWS reserves the right to stop the contractor from executing work, which is not in accordance with the contractor's OHS plan for the site or which poses a threat to the health and safety of persons.

The contractor may not appoint a subcontractor unless the contractor is reasonable satisfied that the subcontractor has necessary competencies and resources to perform work safely. The contractor remains fully responsible for the OHS of the subcontractor and its personnel whilst on site. Any subcontractor appointment shall be approved by the Project Manager. Where a contractor appoints a subcontractor, all OHS Act requirements shall be applicable to the subcontractor. The contractor shall appoint a full-time competent employee in writing as the project supervisor, with the duty of supervising the project.

When the contractor and employees is found contravening OHS Act, the DWS shall stop the work until such time that the contractor implemented corrective measures to the satisfaction of the DWS.

7.1 Section 37.2 Appointment

In accordance with the provisions of Section 37(2) of the Occupational Health and Safety Act 85 of 1993 wherein the Department of Water and Sanitation as Employer has entered into a contract with the Contractor, in terms of which the Contractor is to perform certain work and services for and on behalf of the Employer, subject to the terms and conditions as contained in such contract.

Then parties have agreed that in respect of performance of the work the Contractor shall be responsible for compliance with the Occupational Health & Safety Act and its Regulations. The Employer and Mandatory accordingly enter in this agreement in terms of Section 37(2) of the OHS Act, the terms, and conditions of which are set out in The Occupational Health and Safety Specification.

7.2 Risks Identified by the DWS

The following are the risks associated with this project as identified by the DWS:

- Confined Spaces
- Electrocution or electrical shock and burns
- Scaffold and climbing equipment collapse
- Working at height
- Falling due to slippery surfaces
- Noise due to grinding
- Injury due to hand tools
- Back injuries from carrying heavy loads
- Dehydration
- Attack and theft (secluded site)
- Sun burn
- Insects and snake bite

Notwithstanding the abovementioned risks the contractor shall formulate a risk management plan which will include additional risks identified by the contractor. The cost for OHS shall be included in the Tendered rates

7.3 Lock out

The Contractor shall conduct a risk assessment prior to all tasks.

Prior to decommissioning and commencement of any work, the contractor in conjunction with the Project Manager shall isolate and lock out electrical supply relevant to the scope of work in accordance with the Occupational Health and Safety Act (OHSA). A work permit shall be issued Department of Water and Sanitation before any work commence. The lockout shall be maintained until it is removed by the contractor in conjunction with the Project Manager.

8. INTERPRETATIONS

The Standard Specification: DWS 1601 Paragraph 2 refers.

This Technical Specification shall be read in conjunction with the following:

- Standard Specification: DWS 1601: GENERAL MECHANICAL SPECIFICATION
- Standard Specification: DWS 2020: QUALITY CONTROL SPECIFICATION
- Standard Specification: DWS 9900: CORROSION PROTECTION SPECIFICATION

The convention in terms of naming and numbering gates are as follows:

Facing downstream, in the direction of water flow, reference is made to left hand and right hand.

Definitions

Contractor:	The Party to whom the Tender comprising this Technical Specification is awarded.
Installation:	This shall include, as applicable, all handling and transport from storage, all erection and setting to work. All installation shall be done by the Contractor.
Specification:	This Technical Specification together with any references therein to other documents.
Supply:	This shall include, as applicable, the purchase of materials or goods, manufacture and fabrication, any specified corrosion protection measures and any off-site inspection or testing.